RIDGLEY

RQ98-008

DATE	SUBJECT	PAGE NUMBERS
05-29-98	**OPEN RESUME** (PROMPTED BY 93V-125)	(2)
06-29-98	Letter to Ford Motor from ODI. Request for information concerning certain 1990-1993 F-Series Ford light trucks and chassis cabs with gasoline engines and dual fuel tanks.	(3-8)
08-11-98	Letter to ODI from Ford. Response to ODI 6/29/98 letter	(9-25)
	ATTACHMENT AVAILABLE UPON REQUEST	**(26)**
09-30-98	Letter to ODI from Ford.	(27-34)
	ATTACHMENT AVAILABLE UPON REQUEST	**(35)**
12-15-98	Letter to ODI from Ford.	(36-46)
11-04-99	**CLOSING RESUME** UPGRADED TO EA99-032	(47-50)

ODI Action Number: # RQ98-008

Date: **05-29-98**

Subject: **FORD MOTORS COMPANY**
1990-1993 F-SERIES LIGHT TRUCKS AND CAB CHASSIS WITH GASOLINE ENGINES AD DUAL FUEL TANKS

ALLEGED DUAL FUEL TANK LEAKAGE FAILURE

This file contains consumer letters received by the National Highway Traffic Safety Administration which complain of the alleged defect that is the subject of this Recall Query. It also contains correspondence between this agency and the manufacturer on the subject. Portions of that correspondence may be withheld where the manufacturer has claimed that they are confidential pursuant to the Freedom of Information Act, 5 U.S.C. § 552(b)(4), which exempts from disclosure confidential commercial and financial information. Additional documents relating to this Recall Query may exist, but have not been included in this public file.

If you have any information or concerns you would like to discuss with NHTSA staff, please call the

toll free AUTO SAFETY HOTLINE

800-424-9393

(In the Washington, DC metropolitan area, please call 202-366-0123)

Also, if you wish to discuss the investigation with NHTSA staff, the HOTLINE contact representative will have a technical staff member return your telephone call.

U.S. Department of Transportation

National Highway Traffic Safety Administration

ODI RESUME

INVESTIGATION: RQ98-008 DATE OPENED: 5-26-98
SUBJECT: Ford F-Series Dual Fuel Tank Leakage
PROMPTED BY: *93V-125*
PRINCIPAL ENGINEER: John Ridgley

MANUFACTURER: Ford Motor Company
MODEL(S): F-Series light trucks and cab chassis with gasoline engines and dual fuel tanks
MODEL YEAR(S): 1990-1993
VEHICLE POPULATION: 1,131,000

PROBLEM DESCRIPTION: These vehicles can experience fuel transfer from one tank to the other due to a malfunctioning fuel pump check valve. When the supply fuel is drawn from one tank and a portion of the unused fuel is returned to the other tank, the capacity of the other tank can be exceeded, resulting in fuel overflow past the filler cap.

FAILURE REPORT SUMMARY

	ODI	MANUFACTURER	TOTAL
COMPLAINTS:	98	Unknown	98
CRASHES:	0	"	0
INJ CRASHES:	0	"	0
# INJURIES:	0	"	0
FAT CRASHES:	0	"	0
# FATALS:	0	"	0
OTHER:	1	"	1

DESCRIPTION OF OTHER: Fires

ACTION: An RQ has been opened.

ENGINEER: [signature] 5/29/98 DATE
DIV CHF: [signature] 5-29-98 DATE
OFC DIR: [signature] 5/29/98 DATE

SUMMARY: On July 14, 1993, Ford Motor Company filed a Defect Information Report concerning certain F-Series light trucks and cab chassis built from July 22, 1989 through December 17, 1992. This recall was the subject of an Engineering Analysis, EA93-001. The remedy is to replace the fuel pressure regulator and to install a fuel check valve between each fuel supply line and fuel tank. As of September, 1995, about 79% of the 1,242,746 involved vehicles were inspected and completed.
The purposes of this investigation are to identify the cause(s) of the 47 reported remedy failures and determine if other vehicles should be included in this recall. ODI has 7 reports of the alleged defect on vehicles outside of the recall population.

JUN 29 1998

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

L. W. Camp, Director
Automotive Safety and Engineering Standards Office
Ford Motor Company
Fairlane Plaza South, Suite 400
330 Town Center Drive
Dearborn, MI 48126

NSA-1 Ijer
RQ98-008

Dear Mr. Camp:

The Office of Defects Investigation (ODI) is conducting a review of safety recall 93V-125, being performed by Ford Motor Company. This recall involves certain 1990-1993 F-Series Ford light trucks and chassis cabs with gasoline engines and dual fuel tanks.

ODI has received 124 reports of alleged fuel tank leakage as described in the recall, including 65 reports of alleged remedy failures, and 8 reports of out of scope vehicles which describe having the same problem. A copy of each complaint is enclosed for your information. The purpose of this investigation to examine the adequacy of the recall and whether other vehicles need to be included in the recall campaign.

For purposes of this information request, the following terms are defined:

- **Ford:** the Ford Motor Company and all of its divisions, subsidiaries and affiliated enterprises, including, but not limited to, any distributors of Ford products. The term also includes all headquarters, regional, zone or other offices of Ford or any of its divisions, subsidiaries, and affiliated enterprises and all officers, employees, agents, contractors, and consultants of Ford or any of its divisions, subsidiaries, or affiliated enterprises.

- **Subject vehicles:** all 1990-1993 F-Series Ford light trucks and chassis cabs with gasoline engines and dual fuel tanks.

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- **Safety recall 93V-125:** as described in Ford's Defect Information Report dated July 14, 1993, involving certain 1990-1993 model year F-Series Ford light trucks and chassis cabs with gasoline engines and dual fuel tanks built at the Michigan, Kansas City, Norfolk, and Ontario truck plants from July 22, 1989, through December 17, 1992. These vehicles may experience the transfer of fuel from one tank to the other, which may cause overfilling of the other tank, resulting in fuel overflow past the filler cap.

- **Alleged defect:** any improper installation, failure, malfunction, or unsatisfactory performance of the dual fuel tank assembly or fuel system and all components thereof, which results, or could result, in the leaking of fuel past the filler cap of either fuel tank.

- **Dual fuel tank assembly:** both fuel tanks, the fuel delivery modules, and all their components and the fuel filler pipes and all components attached to the dual fuel tank assembly.

- **Fuel system:** all components that have an effect on or regulate the fuel pressure or fuel flow.

In order for my staff to evaluate the performance of the safety recall, certain information is required. Please provide numbered responses to the following requests, repeating the request verbatim above each response.

The submitted information is to include, but not be limited to, all written reports or documents; transcriptions, notes, or other documentation of oral communications; and information contained in electronic or other storage media. Furnish all requested items, whether or not Ford has verified each one, including all photographs, film, notes, memoranda, and other records pertaining or relating to each item, whether in draft or finalized. Also, any document, record, film, or photograph originally in color must be reproduced in color. If Ford cannot respond to any specific item, please state the reason why you are unable to do so.

If Ford claims that any information or material responsive to the following requests need not be divulged to the National Highway Traffic Safety Administration (NHTSA) because it is privileged, state the nature of that information or material and identify any document in which it is found by date, subject or title, name and position of person from and person to whom it was sent, and name and position of any other recipient. Ford must identify and describe the basis for such privilege claimed and why Ford believes the privilege applies.

1. Furnish (a) the number of subject vehicles manufactured from July 22, 1989, through December 17, 1992, by series description and (b) the number of 1993 model subject vehicles manufactured after December 17, 1992.

2. Furnish the current status of safety recall 93V-125 and include the following:

   a. the number of notification letters sent to owners;
   b. the number of vehicles satisfactorily repaired in this recall;
   c. the number of vehicles reported or known to Ford as destroyed, scrapped, exported, and stolen;
   d. the number of notification letters returned by the U.S. Post Office.

3. Furnish the number of vehicles repaired in safety recall 93V-125 more than once. Identify by model year, model, VIN, build date, the number of repairs for each vehicle, and the dates of these repairs. Furnish Ford's reasons, analyses, and conclusions for the multiple repairs and alleged remedy failures. Furnish Ford's action, plans, and remedies to help prevent the necessity of multiple repairs.

4. Furnish any changes to the recall repairs as stated in your July 1993 notification. Furnish a copy of all drawings, notices (written and oral), bulletins (technical and administrative), advisories and any other communications to dealers, zone offices or field offices pertaining to safety recall 93V-125. If no changes were made, so state.

5. Furnish any changes to the recall repair for the subject vehicles experiencing first time remedy failures. Please provide a copy of all drawings, notices (written and oral), bulletins (technical and administrative), advisories and any other communications to dealers, zone offices or field offices pertaining to safety recall 93V-125.

6. Furnish the number and copies of all the following:

   a. owner reports or consumer complaints; and
   b. other reports, field reports, surveys, or investigations from all sources either received or authorized by Ford, or of which Ford is otherwise aware:

   pertaining to the alleged defect in the subject vehicles. This would include, but not be limited to, complaints or information provided by various consumer groups, government agencies, insurance companies, and other entities which would have provided such information to Ford. Furnish all reports whether or not Ford has verified each report, including all correspondence, notes, memoranda, and other records pertaining or relating to the performance of the assemblies (or components thereof) on the subject vehicles.

7. Furnish the number and copies of:

   a. reports of fires, crashes, and injury incidents;
   b. all subrogation claims; and
   c. all lawsuits, pending and closed, by caption, jurisdiction and docket number in which Ford is or was a defendant or co-defendant.

   Any reports of fires, crashes, injury incidents, subrogation claims, and lawsuits should include, but not limited to, all those which may have occurred, at least in part, to circumstances, conditions, or problems caused by the defect in the subject vehicles. Provide a brief synopsis of each case including Ford's analysis of the alleged incident, a description of any injuries or property damage involved, the identification of the vehicle (model, model year, and VIN), and the vehicle owner (name and address). Identify all parties involved in each lawsuit and furnish representative copies of pleadings and/or legal briefs filed on behalf of Ford in the lawsuits.

8. Furnish a summary table of all reports or incidents known to Ford in which fuel leakage or spillage occurred after they were initially repaired in recall campaign 93V-125. Identify by owner's name, model, model year, VIN, build date, date of incident, and type of incident. Furnish Ford's explanation for each of these incidents including those in List A with this letter. Include all reasons for the alleged inadequate remedy, including, but not limited to, vehicle design, manufacturing considerations, design of the remedy, and service problems.

9. Furnish a summary table and copies of all reports known to Ford of incidents of the alleged defect occurring in the subject vehicles that were manufactured prior to July 22, 1989, or after December 17, 1992.

10. Furnish the company name(s), addresses, and phone numbers of each supplier of the production fuel check valves and the fuel pressure regulators for the subject vehicles. State whether each supplier also provided such parts for the recall remedy. If the supplier of the recall remedy components was different than the production supplier(s), then provide the name and address of the recall remedy supplier.

11. Furnish copies of all correspondence between Ford and the suppliers listed in item10, with respect to design, manufacturing, performance, durability, quality, testing or modification(s) after July 14, 1993. If any correspondences were oral or were conducted electronically, provide a written transcript or summary of each communication and include a statement that identifies the participants and the date of the communication.

12. Identify and describe all modifications or changes made by Ford or its suppliers in the manufacture, installation, supplier, design, or materials composition of the dual fuel tank assemblies or fuel system that is or could be related to the defect in the subject vehicles. The following information must be included, as a minimum, for each such modification or change:

    a. the date on which the modification or change was incorporated;
    b. a description of the modification or change;
    c. the reason for the modification or change; and
    d. whether the modified or changed components can be interchanged with prior production components and systems.

13. Furnish Ford's analyses, conclusions, and opinions on (a) the effectiveness of recall 93V-125; (b) whether the recall should be extended to other Ford vehicles; and (c) the causes of the alleged fuel leaks described in the consumer reports provided with this letter.

14. Furnish a copy of all documents not specifically requested, which Ford believes may be pertinent to the alleged defect and its resolution or which were used in formulating its assessment of the alleged defect and its remedy.

15. Furnish Ford's policy on handling remedy failures and reports of remedy failures for safety recall 93V-125.

This letter is being sent to your company pursuant to 49 U.S.C. §30166 which authorizes NHTSA to perform any investigative activity that may be necessary to enforce Chapter 301 of Title 49. Your failure to respond promptly and fully to this letter could subject Ford to civil penalties pursuant to 49 U.S.C. §30165 or lead to an action for injunctive relief pursuant to 49 U.S.C. §30163.

Your response to this letter, in duplicate, must be submitted to this office by **August 11, 1998**. Please include in your response the identification codes referenced on page 1 of this letter. If you find that you cannot provide all of the requested information within the time allotted, you must request an extension from me no later than 5 working days prior to the date on which your response is due (202) 366-5226. If circumstances prevent you from submitting all information requested by the due date, you must submit by that date all the information that you have available.

If you consider any portion of your response to be confidential information, include that material in an enclosure marked "Confidential." Separately, Ford must submit a copy of all such material to the Office of Chief Counsel (NCC-30), National Highway Traffic Safety Administration, 400 Seventh Street, SW, Washington, DC 20590, and comply with all other requirements for the submission of confidential business information stated in 49 CFR Part 512.

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If you have any technical questions concerning this matter, please contact me at (202) 633-5226 or by fax at (202) 366-7882.

Sincerely,

/s/

Jonathan D. White, Chief
Recall Analysis Division
Office of Defects Investigation
Safety Assurance

Enclosures:
124 Consumer Complaints
List A

Ford Motor Company
Automotive Safety Office
Environmental and Safety Engineering

330 Town Center Drive
Dearborn, Michigan 48126

August 11, 1998

Mr. Jonathan D. White, Chief
Recall Analysis Division
Office of Defects Investigation, Safety Assurance
National Highway Traffic Safety Administration
400 Seventh Street, S.W.
Washington, DC 20590

Dear Mr. White:

Subject: Recall 98V-125 (93S60); RQ98-008; NSA-1 [illegible]

Enclosed is our partial response to the agency's letter dated June 29, 1998, requesting information to examine the adequacy of the subject recall and whether other vehicles need to be included in the recall campaign. We are providing a complete answer to nine of the fifteen requests with this partial response.

Ford is continuing to conduct file searches, analyze and summarize customer reports, and review information necessary to complete our responses to the remaining six requests. We believe that we will be able to complete our reply by September 30, 1998.

If you have any questions concerning this response, please contact Bob Wheelock of my staff at (313) 337-6553.

Very truly yours,

R. W. Camp

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Enclosures

Enclosure
August 11, 1998

Ford Response to RQ98-008

The following is Ford Motor Company's partial response to the agency's request letter dated June 29, 1998. This inquiry involves the adequacy of recall repair for the campaign 93V-125 (Ford's 93S68). The recall included 1990-1993 F-Series light trucks manufactured through December 17, 1993 with gasoline engines and dual fuel tanks.

As agreed with you in a August 4, 1998 telephone conversation from Mr. R. J. Wheelock of my staff and Mr. Jonathan T. White of the Office of Defects Investigations, Ford is providing its response to Request Numbers 1, 2, 4, 5, 6, 7, 10, 11, and 12 in a partial response at this time. The remainder of our responses require analysis of the large volume of information collected to date. The extension was granted due to the significant amount of time that will be required for this analysis. The Ford response to Request Numbers 3, 8, 9, 13, 14 and 15 will be provided in our final response on or about September 30, 1998.

Ford's response to this Recall Questionnaire was prepared pursuant to a diligent search for the information requested. We have made every effort to provide responsive documents and to supply thorough explanations intended to assist you in understanding the documents provided. The documents provided along with this response were gathered from Ford employees who were identified as having relevant knowledge or information concerning the subject matter of the information request.

While we have employed our best good faith efforts to provide responsive information requested by the agency, it bears mentioning that any attempt to identify all responsive documents or all knowledgeable employees within Ford Motor Company is a daunting task. Ford has employees located around the world who collectively generate millions of documents every year. Employees change jobs and relocate to different Ford facilities in the course of their careers and the documents that they generate may or may not move with them. Moreover,

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because of the breadth of Ford's global operations, responsive information is maintained in numerous locations and may be moved from time to time as Ford's organizational structure and needs change. Accordingly, Ford does not, and could not possibly, represent that this response reflects or includes "all" potentially responsive information located anywhere within Ford Motor Company worldwide. Rather, as stated above, the scope of the investigation conducted to locate responsive information focused on those Ford employees most likely to be knowledgeable about the subject matter of this inquiry, and to reviewing Ford files in which information related to this matter ordinarily would be expected to be found. We, of course, will answer any question you may have as to the scope or the specific nature of the searches that were made.

The term "sub ect vehicles" has been defined to include all 1990 through 1993 F-150, F-250, F-350 and Superduty light trucks and chassis cabs with gasoline engines and dual fuel tanks, and the term "alleged defect" has been defined as "any improper installation, failure, malfunction, or unsatisfactory performance of the dual fuel tank assembly or fuel system and all components thereof, which results, or could result, in the leaking of fuel past the filler cap of either fuel tank." Ford respectfully ob ects to the Agency's definition of the alleged defect to the extent that it seeks information related to the "unsatisfactory performance" of the sub ect components, which may be a highly sub active determination, as it could relate to a customer satisfaction issue rather than a safety risk.

Confidential business and cost information obtained from engineers and management is being submitted to the N TSA's Office of the Chief Counsel pursuant to 49 CFR "art 512. Responsive documents that are privileged or attorney work product are reflected on the Privilege Log, Attachment 1, and also on the Lawsuits and Claims Summary, see response to Request number 7.

Answers to your specific requests are presented below and include documents and information in existence as of the date of the inquiry, June 29, 1998. As requested, after each numeric designation, we have set forth verbatim the request for information followed by our response to it.

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<u>Request No. 1</u>

Furnish (a) the number of subject vehicles manufactured from July 22, 1989 through December 17, 1992, by series description and (b) the number of 1993 model subject vehicles manufactured after December 17, 1992.

<u>Answer</u>

There were approximately 1,242,756 subject vehicles manufactured between July 22, 1989 through December 17, 1993, which were included in recall 93V-125. There were approximately 274,352 subject 1993 model year vehicles manufactured after December 17, 1992, which were not part of the subject recall. Vehicle counts by series were not readily available from our computer database at the time of this response. If the agency still believes this information is required for their analysis, we will attempt to provide it if requested.

<u>Request No. 2</u>

Furnish the current status of safety recall 93V-125 and include the following:

a. the number of notification letters sent to owners;
b. the number of vehicles satisfactorily repaired in this recall;
c. the number of vehicles reported or known to Ford as destroyed, scrapped, exported, and stolen;
d. the number of notification letters returned by the U.S. Post Office.

<u>Answer</u>

Answers to part a) through part d) of your requests follow:

a) 1,242,756 notification letters sent to owners
b) 1,093,892 vehicles received recall repairs

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c) 2,133 vehicles were reported destroyed/scrapped/ stolen. Ford does not have data on vehicles exported out of the USA by others.
d) 3,264 notification letter were returned by the post office as undeliverable.

Ford's current completion rate for this recall is 88.3%.

Request No. 4

Furnish any changes to the recall repairs as stated in your July 1993 notification. Furnish a copy of all drawings, notices (written and oral), bulletins (technical and administrative), advisories and any other communications to dealers, zone offices or field offices pertaining to safety recall 93V-125. If no changes were made, so state.

Answer

Ford has located nine service-related messages to dealers relating to the alleged concern. The recall repair instructions sent to dealers or zone offices after our July 1993 notification are presented in Attachment II. In addition, Technical Service Bulletins covering the alleged condition between 1990 to date are presented in Attachment III. Copies of field recall bulletins sent to dealers, which have been previously supplied to the agency near the time of the recall, are provided in Attachment IV.

We assume this request does not seek information related to electronic communications between Ford and its dealers regarding the order, delivery, or payment for replacement parts even though the request refers to any other communications .

Request No. 5

Furnish any changes to the recall repair for the subject vehicle experiencing first time remedy

failures. Please provide a copy of all drawings, notices (written and oral), bulletins (technical and administrative), advisories and any other communications to dealers, zone offices or field offices pertaining to safety recall 93V-125.

Answer

The procedures and communications provide in response to Request number 4 would also apply to this request. However, if the recall repair does not correct the fuel cross-flow symptom, there are two service-related messages, 03806 and 03807, that provide diagnostic repair information for the return fuel side. These procedures were issued May 6, 1994, and are included in response to Request number 4, see Attachment II.

If the remedy repair did not correct the alleged concern, then additional fuel systems checks would be necessary to determine and isolate the potential root causes. In rare circumstances other root causes may result in similar symptoms as the recall condition. In general, these other potential root causes are believed to be the result of poor maintenance, improper service or normal wear out. These kinds of repairs are considered to be outside the scope of this recall.

In addition, improper recall service by the Ford dealership may also be a cause of reported failures. A secondary root cause for this recall campaign was related to kinked nylon fuel lines on 1990-1991 vehicles. If the fuel system was serviced (i.e., for a fuel pump or fuel sender replacement) the fuel tank fuel lines could become kinked when the tank is re-installed. Dealers were cautioned in TSB's and recall instructions to "be careful not to kink fuel lines when re-installing fuel tanks". The kinked fuel lines may not be visible to the technician after the vehicle repairs are completed.

Also, it is possible that in rare circumstances the recall service kits could have defective one way stainless steel check valves that may not correct the recall issue. As with all Ford parts and service, the recall repair kit components and service are warranted for 12 months or 12,000 miles, whichever occurs first.

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Request No. 6

Furnish the number and copies of all the following:

a. owner reports or consumer complaints; and
b. other reports, field reports, surveys, or investigations from all sources either received or authorized by Ford, or of which Ford is otherwise aware;

pertaining to the alleged defect in the subject vehicles. This would include, but not be limited to, complaints or information provided by various consumer groups, government agencies, insurance companies, and other entities which would have provided such information to Ford. Furnish all reports whether or not Ford has verified each report, including all correspondence, notes, memoranda, and other records pertaining or relating to the performance of the assemblies (or components thereof) on the subject vehicles.

Answer

For purposes of identifying incidents potentially involving the alleged defect and any related documents, Ford has gathered "owner reports" and "field reports" maintained by Ford Customer Service Division (FCSD). A description of those information sources is appropriate to explain the nature of the information that Ford is providing.

Owner Reports. As the agency is aware, within FCSD's North American Customer Service Operations, there is a Customer Assistance Center (CAC) that is responsible for facilitating communication among customers, dealerships and Ford Motor Company. Among other things, the CAC handles telephonic, internet, and written inquiries, suggestions, informational requests, and concerns (contacts) from Ford and Lincoln-Mercury vehicle owners about their vehicles or sales and service process. The contacts are fielded by CAC customer service representatives, who enter a summary of the customer contact into a database known as FORS (Faster Owner Relations System).

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Certain contacts, such as letters from customers, are entered into the MORS databases and also are copied to microfilm, or more recently, imaged and stored electronically.

The CAC assigns to each vehicle-related contact report a "symptom code" or category that generally reflects the nature of the customer contact or vehicle concern, as described by the owner. The CAC does not undertake to confirm the accuracy of the description provided by the owner; they simply record what is reported. Therefore, given the complexity of the modern motor vehicle, it is Ford's experience that a significant percentage of owner contacts are not sufficient to make a technical assessment of the condition or the vehicle or the cause of the event reported. Accordingly, although MORS contact reports may be useful in identifying potential problems and trends, the records are not the empirical equivalent of confirmed incidents and/or dealership diagnoses.

In responding to this particular information request, Ford searched all MORS contact reports for 1990 through 1993 model year Ford F-150, F-250, F-350 and Superduty vehicles, from January 1, 1989 through June 29, 1998, the date of this inquiry, with the following symptom codes: 404300 (Fuel System); 204125 (Electronic Display/Fuel Gauge), 704134 Fire/Trunk); 704147 Fire//Under Vehicle); 704234 (Smoke/Trunk); 704247 Smoke/Under Vehicle); 704334 (Trunk/Scorched/Burnt); 704347 (Scorched/Burnt/Under Vehicle). The MORS database maintains customer contact information for only the last 5 calendar years. Contact reports were reviewed for allegations relating to the alleged defect and responsive reports are shown in Table 1.

Ford has also included owner reports which are ambiguous as to whether they fully meet the alleged defect criteria. We have listed these reports in Table 1 as "non-specific allegations" for your review because of the broad scope of the request. Based on our engineering judgment, the information in these reports is insufficient to support a determination that they pertain to the alleged defect.

In the interest of responding promptly to this inquiry, Ford has not undertaken to gather the microfilm or electronic images related to these contacts because of the largely duplicative nature of the information contained in the

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microfilm and images, as well as the time and the burden associated with locating and producing those documents. The pertinent information related to those contacts generally would be included in the contact reports obtained from the MORS system. To the extent that those documents exist, they are reflected in the "Micro NBR:" field of the MORS contact reports. Upon request, Ford will attempt to locate any specific items that are of interest to the agency.

Field Reports. Within FCSD, there is a Vehicle Service & Programs Office that has overall responsibility for vehicle service and technical support activities, including the administration of field actions. That Office is the primary source within Ford of vehicle concern information originating from Ford and Lincoln-Mercury dealerships, field personnel, and other sources. The information is maintained in a database known as the Common Quality Indicator System (CQIS). The CQIS database includes reports compiled from more than 40 Company sources (e.g., Company-owned vehicle surveys, service technicians, field service and quality engineers, and technical hotline reports, etc.) providing what is intended to be a comprehensive concern identification resource. As with MORS contact reports, CQIS reports are assigned a "symptom code" or category that generally reflects the nature of the concern.

In responding to this particular information request, Ford searched all CQIS reports dated January 1, 1989 through June 29, 1998 for 1990 through 1993 model year F-150, F-250, F-350, and Superduty vehicles with the following symptom codes: 4 04 (Engine/Fuel System Concerns); 04 99 (Engine/Other); 02 06 (Warning Indicators); 02 01 (Instrumentation); and 07 04 (Unknown/Smoke/Fire). Ford also performed a CQIS computerized word search of all foregoing symptom code files using the following criteria: "switch", "cross", "transfer", "xflow", "x flow", "xfer", "fill", "xflow", and "9B563." Reports were reviewed for allegations relating to the alleged defect and the responsive reports location are shown in Table 1.

Ford has also included field reports which are ambiguous as to whether they fully meet the alleged defect criteria. We have included these reports as "non-specific allegations" for your review because of the broad scope of the request. Based on our engineering judgment, the information in

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these reports is insufficient to support a determination that they definitely pertain to the alleged defect.

In addition, although it appears that this request is limited to owner and field report data, Ford is construing sub-part b broadly because of its reference to "surveys and investigations." Therefore, Ford has attempted to be over inclusive and is providing studies, surveys, and investigations related to the recall condition, including other related documents, such as notes, correspondence, and e-mail communications. These document locations are also shown in Table 1.

Warranty Data. In responding to this particular information request, Ford searched warranty reports for all claims dated September 29, 1993, the date of public announcement of the recall campaign, through June 29, 1998 for 1990 through 1993 model year F-150, F-250, F-350, and Superduty vehicles with gasoline engines. Recall base part numbers for the fuel pressure regulator (9C968), fuel delivery modulator (9B307), fuel pump (9350), recall kit (9155) and check valve (9A407) were also included in the search criteria. The VIN line item un-filtered reports of each claims is provided in the Appendix as shown in Table 1. Due to software problems associated with printing this Appendix, the un-filtered warranty data will be mailed separately.

In addition to the documents provided with this partial response, Ford has identified a collection of documents that was produced during discovery in a lawsuit that contained allegations concerning this recall condition. Some of those documents appear to be responsive to this request. Ford therefore anticipates that it will be providing additional documents to the agency when a review of these documents is completed. These documents will be sent to the agency along with our final response.

Table 1: Location of Data/Information From Searches

Database/File Source	Data/Record Assessment	Data/Document Location
CQIS	Responsive	Box #5
CQIS	Non-Specific Allegations	Box #3
MORS	Responsive	Box #1
MORS	Non-Specific Allegations	Box #2, #3, #4
Warranty	Un-Filtered data	Appendix To be mailed when printed
Engineering, Management Files	Responsive	Box #6, #7, #8, #9
Engineering/ Management Files	Confidential Responsive	Mailed to NHTSA's Office of the Chief Counsel Box #12
Lawsuits and Claims	Responsive	Box #10, #11

Request No. 7

Furnish the number and copies of:

a. reports of fires, crashes, and injury incidents;
b. all subrogation claims; and
c. all lawsuits, pending and closed, by caption jurisdiction and docket number in which Ford is or was a defendant or co-defendant.

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Any reports of fires, crashes, injury incidents, subrogation claims, and lawsuits should include, but not limited to, all those which may have occurred, at least in part, to circumstances, conditions, or problems caused by the defect in the subject vehicles. Provide a brief synopsis of each case including Ford's analysis of the alleged incident, a description of any injuries or property damage involved, the identification of the vehicle (model, model year, and VIN), and the vehicle owner (name and address). Identify all parties involved in each lawsuit and furnish representative copies of pleadings and/or legal briefs filed on behalf of Ford in the lawsuits.

Answer

For purposes of identifying incidents potentially involving the recall condition, Ford has gathered claim and lawsuit information maintained by Ford's Office of the General Counsel (OGC). Ford's OGC is responsible for handling product liability lawsuits, claims, and consumer breach of warranty lawsuits against the Company. Based on a reasonable and diligent search, Ford has identified 19 lawsuits and 53 claims that may be related to the recall condition in the subject vehicles. However, it should be noted that Ford has attempted to be over inclusive in this respect and many of the lawsuits and claims contain ambiguous allegations which cannot be conclusively linked to the alleged defect. For each lawsuit, Ford is providing, to the extent available, a copy of the complaint, Ford's answer to the complaint, Plaintiff's responses to Ford's and/or other parties' discovery requests, Ford's responses to Plaintiff's discovery requests, Plaintiff's medical records, police/fire department/EMS reports, vehicle recall history, vehicle warranty history, owner communications with Ford, photographs, and/or non-privileged vehicle inspections and expert reports. For each claim, Ford is providing, to the extent available, the claimant's medical records, police/fire department/EMS reports, vehicle recall history, vehicle warranty repair history, owner communications with Ford, photographs, claim disposition notification, Ford requests for information to claimant, non privileged vehicle inspections and the owner or his/her attorney's description of

incident/claim and accompanying information. The location of lawsuits and claim documents is shown in Table 1.

As requested, we have provide a brief synopsis of these lawsuits and claims information in Attachment V. Please note that certain Ford vehicle inspection reports have not been produced (as indicated on the synopsis) on attorney work product grounds.

In addition to Attachment V summary, there were 32 alleged reports of fires from MCRS file searches and these reports are presented in Attachment VI.

Request No. 10

Furnish the company name(s), addresses, and phone numbers of each supplier of the production fuel check valves and the fuel pressure regulators for the subject vehicles. State whether each supplier also provided such parts for the recall remedy. If the supplier of the recall remedy components was different than the production supplier(s), then provide the name and address of the recall remedy supplier.

Answer

A list of all the recall part numbers and their suppliers are provided in Attachment VII.

The Fuel Delivery Module's (FDM) supply side poppet check valve was the primary root cause of this recall and is an integral/internal part of the FDM. The FDM assembly was supplied by Walbro.

Supplier	WALBRO AUTOMOTIVE CORPORATION Parent Code: S37C
Contact:	SUE COGSWELL DEL Eff Date: 11/01/97
Phone:	219-894-3163 Ext: 123 Fax Phone: 219-894-4427
Street:	925 W MAIN ST
City:	LIGONIER
County:	NOBLE
State:	IN

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Zip: 467670350

In order for the agency to understand the operation of the dual tank system, a schematic illustration of the FDM's internal components and a system flow diagram is provided to the agency in Attachment VIII. The FDM contains the fuel slosh reservoir, fuel gauge sending unit, fuel pump and intake screen, and other associated components (poppet check valves) to manage fuel flow to the engine and the return flow back to the same fuel tank. The system contains two FDM assemblies which are connected in parallel via a common supply line and common return line. Fuel flow is controlled by a system of valves that are designed to direct return fuel flow from the engine back to the operating or selected fuel tank.

When a given fuel tank is chosen via the instrument panel selector switch, power is directed to the fuel pump in that tank. The fuel pump creates the fuel flow which is delivered to the engine via the supply line. Prior to entering the supply line, fuel passes through a poppet check valve in the header assembly of the FDM. The supply side poppet check valve is designed to prevent the reverse flow of fuel through the supply line into the non-operating FDM assembly or the un-selected fuel tank. When energized, the fuel pump also pressurizes the diaphragm on the return shuttle valve in the FDM. This pressure on the diaphragm causes the return shuttle valve to open, thereby, allowing the return fuel to enter the operating (selected) fuel tank. The shuttle valve on the non-operating FDM is spring loaded to prevent the return fuel from entering the un-selected fuel tank. Fuel system operating pressure is controlled by the fuel pressure regulator and is mounted on the engine fuel rail (not shown in this diagram).

The Ford safety recall 93S69 addressed the field failures involving the supply side poppet check valves. The campaign repair was to install additional one way stainless steel check valves downstream of the poppet valves. The poppet check valve is not serviced separately from the FDM assembly. The stainless steel valves were more robust and would provide cross-flow protection if the poppet valve should fail for any reason.

At the time of the safety recall, field analyses of returned parts showed the significant root cause was due to

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such failures of the supply side poppet valve located within the FDM. Ford's Field Review Evaluation Paper and other related documents discovered during our searches for this response are considered confidential business and cost sensitive information by Ford and are being submitted to the NHTSA's Office of the Chief Counsel pursuant to 49 CFR Part 512. Although many of the same confidential documents were found across many individuals, each document was considered as a separate document and all of these documents will be sent to the Office of Chief Counsel.

Now, after 1,343,736 vehicles have been in service from 3 to 8 years, it appears that a small number of other internal FDM components, that also help to manage fuel system flow to and from the fuel tanks, could potentially deteriorate or fail. These other internal components have different failure modes and corresponding different root causes; however, they may result in a similar symptom to the vehicle owner.

Although a complete field analysis has only begun, fuel system engineering estimates the probable cause of other FDM system components failures are most likely due to the following:

1. Improper servicing that results in a kinked return fuel lines when the rear tank is removed and reinstalled.

2. Excessive dirt or foreign particles that find their way into the vehicle's fuel tanks from multiple sources, e.g., re-fueling with un-filtered/dirty gas from a service station or from a portable gas can, vehicle operation without a gas cap, re-installation of a dirty/contaminated gas cap that has rested against an un-cleaned body side panel, use of an un-cleaned siphon hose inserted into the fuel tank, fuel tank corrosion, etc.

3. "Bad batches" of refined gasoline or certain "gas tank supplements/ additives" customers may put into their gas tanks. These substances can chemically attack the Ford designed materials and potentially cause premature deterioration and/or failure of these component's materials.

Ford believes that these "other" causes are for the most part a direct result of poor vehicle maintenance or service each owner/operator is responsible. Fuel tank FDM component durability may be sacrificed if contamination is introduced into the fuel system and/or the fuel filter is not serviced/replaced every 15,000 miles. Ford designs its fuel systems to handle a wide variety of gasoline mixtures and fuel tank contamination, but occasionally there may be instances where these field tolerance levels are exceeded.

Request No. 11

> Furnish copies of all correspondence between Ford and the suppliers listed in item ~~11~~ 10, with respect to design, manufacturing, performance, durability, quality, testing or modification(s) after July 1!, 1993. [sic] If any correspondences were oral or were conducted electronically, provide a written transcript or summary of each communication and include a statement that identifies [illegible] and the date of the communication.

Answer

Included among the documents provided to the agency are copies of correspondence between Ford and suppliers relating to the alleged defect. As described previously in response to Request No. 6, the material requested in this request is provided as shown in Table 1. The information requested is organized in the manner in which it was gathered. In interest of being over inclusive, some of this material is dated after July 14, 1993. Supplier communications located by our searches is contained within the documents found in Boxes tbd through tbd.

With respect to summarizing oral or electronic communications, there are potentially many hundreds of such conversations that have occurred 5-8 years ago. Any attempt now to itemize such conversations would be extremely difficult to impossible. If it would be of assistance to the Agency, Ford would be happy to arrange a meeting between the agency and

Ford/Walbro personnel who were principally involved in the recall remedy.

Request No. 12

Identify and describe all modifications or changes made by Ford or its suppliers in the manufacture, installation, supplier, design, or materials composition of the dual fuel tank assemblies or fuel system that is or could be related to the defect in the subject vehicles. The following information must be included, as a minimum, for each such modification or change:

a. the date on which the modification or change was incorporated;
b. a description of the modification or change;
c. the reason for the modification or change; and
d. whether the modified or changed components can be interchanged with prior production components and systems.

Answer

A table of changes and modifications is provided in Attachment IX.

ATTACHMENT

AVAILABLE UPON REQUEST

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L.W. Camp
Director
Automotive Safety Office
Environmental And Safety Engineering

Ford Motor Company
330 Town Center Drive
Dearborn, Michigan 48126 USA

September 30, 1998

Mr. Jonathan D. White, Chief
Recall Analysis Division
Office of Defects Investigation, Safety Assurance,
National Highway Traffic Safety Administration
400 Seventh Street, S.W.
Washington, DC 20590

Dear Mr. White:

Subject: Recall 93V-125 (93S68): RQ98-008; NSA-lljer

Enclosed is our response to the agency's letter dated June 29, 1998, requesting information to examine the adequacy of the subject recall and whether other vehicles need to be included in the recall campaign. We previously responded to a number of these requests in a response dated August 11, 1998. The summary tables provided with this response are not yet finalized and will continue to be updated. When the tables are completed, the final versions will be forwarded to you for your files.

Our investigations and analysis into the issues raised in this RQ are also continuing and we will provide our complete assessment when it is finalized. However, in order to meet our deadline obligation to the agency we are supplying this "work in progress" response at this time.

A preliminary review of the data provided in these responses indicates there are numerous reports of improperly performed recall service or damaged parts that resulted in additional repairs after the recall service was initially performed.

Very truly yours,

L. W. Camp

Enclosures

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Enclosure
September 30, 1998

Ford Response to RQ98-008

The following is Ford Motor Company's final response to Request Numbers 3, 14 and 15, and current response to Request Numbers 6, 9, 13 for the agency's request letter dated June 29, 1998. This inquiry involves the adequacy of recall repair for the campaign 93V 125 (Ford's 93S68). The recall included 1990-1993 F-Series light trucks manufactured through December 17, 1993 with gasoline engines and dual fuel tanks. We have previously responded to your Request Numbers 1, 2, 4, 5, 6, 7, 10, 11 and 12 on August 11, 1998.

Ford's response to this Recall Questionnaire was prepared pursuant to a diligent search for the information requested. We have made every effort to provide responsive documents and to supply thorough explanations intended to assist you in understanding the documents provided. The documents provided along with this response were gathered from Ford employees who were identified as having relevant knowledge or information concerning the subject matter of the information request.

While we have employed our best good faith efforts to provide responsive information requested by the agency, it bears mentioning that any attempt to identify "all" responsive documents or "all" knowledgeable employees within Ford Motor Company is a daunting task. Ford has employees located around the world who collectively generate millions of documents every year. Employees change jobs and relocate to different Ford facilities in the course of their careers and the documents that they generate may or may not move with them. Moreover, because of the breadth of Ford's global operations, responsive information is maintained in numerous locations and may be moved from time to time as Ford's organizational structure and needs change. Accordingly, Ford does not, and could not possibly, represent that this response reflects or includes "all" potentially responsive information located anywhere within Ford Motor Company worldwide. Rather, as stated above, the scope of the investigation conducted to locate responsive information focused on those Ford employees most likely to be knowledgeable about the subject matter of this inquiry, and to reviewing Ford files in which information related to this matter ordinarily would be expected to be found. We, of course, will answer any question you may have as to the scope or the specific nature of the searches that were made.

The term "subject vehicles" has been defined to include all 1990 through 1993 F-150, F-250, F-350 and Superduty light trucks and chassis cabs with gasoline engines and dual fuel tanks, and the term "alleged defect" has been defined as "any improper installation, failure, malfunction, or unsatisfactory performance of the dual fuel tank assembly or fuel system and all components thereof, which results, or could result, in the leaking of fuel past the filler cap of either fuel tank." Ford respectfully objects to the agency's definition of the alleged defect to the extent that it seeks information related to the "unsatisfactory performance" of the subject components, which may be a highly subjective determination, as it could relate to a customer satisfaction issue rather than a safety risk.

Answers to your specific requests are presented below and include documents and information in existence as of the date of the inquiry, June 29, 1998. As requested, after each numeric designation, we have set forth verbatim the request for information followed by our responses to it.

One additional lawsuit and one additional claim were located that make allegations related to the alleged defect, since our partial response was submitted on August 11, 1998. Copies of the lawsuit and claim are provided in a folder in Box #13 of this submission. In addition, they have been added to the Lawsuits and Claims Summary Table which was provided in Attachment V of our partial response. We recommend that these documents, summary table page and additional lawsuit and claim, be filed with the August 11, 1998 submission under Attachment V and Boxes #10 or #11, respectively.

Request No. 3

> Furnish the number of vehicles repaired in safety recall 93V-125 more than once. Identify by model year, VIN, and build date the number of repairs for each vehicle and the dates of these repairs. Furnish Ford's reasons, analyses, and conclusions for the multiple repairs and alleged remedy failures. Furnish Ford's action, plans, and remedies to help prevent the necessity of multiple repairs.

Answer

A special computer program was written and used to search our recall database and find all vehicles with multiple repairs for this campaign. The results are shown in Attachment I. The data summary shows there were 625 vehicles that had two

or more recall repairs entered into the database out of the 1,096,948 total vehicles repaired as of September 21, 1998. As requested, Attachment I also provides recall repair dates corresponding to each VIN when multiple recall repairs are present in the database. The data sheets are grouped by model year. Vehicle build date information was not extracted from the database at this time. However, if the agency, after reviewing the information provided, believes the build date information is important for their analysis, then Ford will make every effort to supply this information, upon request.

Ford realized before the campaign was launched that the reinstallation of the fuel tank assembly could result in kinked fuel lines, if the technician was not careful. Kinked fuel lines could result in causing a cross flow concern after the recall kit was installed. To inform the dealership and technicians, Ford included caution instructions on dealer recall bulletins, see Attachment IV page 10 of our partial response dated August 11, 1998, and with each kit instruction sheet. The caution instructions stated "Be careful not to kink fuel lines when reinstalling fuel tanks". The assessment of kinked fuel lines with respect to multiple repairs will be further discussed in more detail in our final response to Request Number 13.

Other causes for multiple repairs will be investigated along with the data provide in response to Request Number 8. Ford's reasons, analyses, conclusions for the multiple repairs and Ford's action, plans and remedies to help prevent the necessity of multiple repairs will be fully addressed in our final response to Request Number 13.

Request No. 8

> Furnish a summary table of all reports or incidents known to Ford in which fuel leakage or spillage occurred after they were initially repaired in recall campaign 93V-125. Identify by owner's name, model, model year, VIN, build date, date of incident and type of incident. Furnish Ford's explanation for each of these incidents including those List A with this letter. Include all reasons for the alleged inadequate remedy, including, but not limited to, vehicle design, manufacturing considerations, design of the remedy, and service problems.

Answer

The information provided to the agency on August 11, 1998 in response to Request Number 6 has been summarized and tabled from our database searches of CQIS, MORS and warranty.

The warranty word search criteria used to find potential reports include word searches of the comment sections that could possibly relate to the cross flow concern or symptoms (i.e., recall, 93S68, transfer, front to rear, rear to front, overflowing, pumping, siphon, leak, leakage, dump, fill, tank to tank, cross, x-flow, xfer and/or fill). Also, the repair was checked against base part numbers (i.e., recall kit 9155, fuel pressure regulator 9C968, check valve 9A407, fuel pump 9350 or 9H307) which may be replaced to repair the concern.

The criteria used to include reports into these tables include any form of spillage or leakage of fuel from the fuel tanks from the comment sections or per customer concern codes that reference fuel leakage symptoms. Many of the reports included in these "work in progress" summary tables have not been assessed against the after recall repairs criteria. Also, duplicate entries from the different database sources have not been removed; the manually entered information has not been double checked for authentication, and each report has not been verified that it meets the agency's request criteria. The summary tables are provided in the Attachments for each model year subject vehicles per the following table:

Model Year	Attachment Number
1990	II
1991	III
1992	IV
1993	V

We are continuing our assessment of this data in order to provide a more detailed explanation of each report as requested. We are supplying the "work in progress" summary tables at this time in order to meet our deadline obligation to the agency.

In order to respond to the request of "all reports or incidents," Ford plans to add the appropriate vehicles from the agency's List A and B reports and the Lawsuits and Claims reports from our response to Request Number 7 to the above summary tables.

The agency's Lists A and B reports were entered into a spreadsheet summary table and are presented in Attachment VI. Please note that a few VIN errors were found and corrected, and duplicate records shown on both lists were removed. Each VIN was entered into our warranty database in order to obtain fuel tank/pump reports which are also included in the summary table.

Request No. 9

Furnish a summary table and copies of all reports known to Ford of incidents of the alleged defect occurring in the subject vehicles that were manufactured prior to July 22, 1989, or after December 17, 1992.

Answer

The information provide to the agency on August 11, 1998 in response to Request Number 6 has been summarized and tabled from our database searches of CQIS, MORS and warranty. The warranty word search criteria used to include reports into this table include word searches of the comment sections that could possibly relate to the cross flow concern or symptoms (i.e., recall, 93S68, transfer, front to rear, rear to front, overflowing, pumping, siphon, leak, leakage, dump, fill, tank to tank, cross, x-flow, xfer and/or fill).

From the above list of potential reports, the repair action was checked against the base part numbers (i.e., recall kit 9155, fuel pressure regulator 9C968, check valve 9A407, fuel pump 9350 or 9H307) that could be replaced to repair the concern. Customer concern codes that reference fuel leak were also searched to include all potential reports. Duplicate entries from the different database sources have not been removed; the manually entered information has not been double checked for authentication, and each report has not been individually reviewed or verified.

Attachment VII contains a "work in progress" summary table for the alleged defect on 1993 vehicles manufactured after December 17, 1992, (i.e., all 1993 subject vehicles outside the recall population). Appropriate vehicle reports from Lawsuits and Claims data and from Lists A and B received from NHTSA are to be added to this list in order to respond to "all reports known to Ford" request.

Request No. 13

Furnish Ford's analysis, conclusions and opinions on (a) the effectiveness of recall 93V-125; (b) whether the recall should be extended to other Ford vehicles; and (c) the causes of the alleged fuel leaks described in the consumer reports provided with this letter.

Answer

Ford has not completed its assessment of the materials provided to the agency in our responses. However, there are numerous reports which indicate improperly performed recall service or damaged parts that resulted in repeat repairs after the recall service was performed. Ford is continuing its investigation and will update the agency when our assessments are complete.

Request No. 14

> Furnish a copy of all documents not specifically requested, which Ford believes may be pertinent to the alleged defect and its resolution or which were used in formulating its assessment of the alleged defect and its remedy.

Answer

We believe that we have provided the pertinent requested information and respectfully submit that a request for "all documents not specifically requested herein" is extremely vague, broad, and unduly burdensome and that neither Ford nor any other organization of comparable size can be certain that it has located "all documents not specifically requested herein" that might be deemed by someone at some later time to have been "relevant" to the "alleged defect" on the subject vehicles.

Notwithstanding the foregoing, Ford has attempted to construe this request broadly and is providing the agency with additional documents that have not been requested but relate to the general subject matter of this inquiry. Specifically, in the course of identifying lawsuits and claims potentially related to the alleged defect, we learned that numerous documents were provided to plaintiffs in the course of discovery in the lawsuit entitled Sooner Freight v. Ford Motor Company, which contained allegations that appear to relate to the alleged defect. This case resulted in a judgment in favor of Ford.

We have provided the agency with copies of the documents from this lawsuit that pertain to the alleged defect in the subject vehicles in Boxes labeled #13 and #14. Because of the voluminous nature of the documents produced in that lawsuit, we have not included documents that were produced to plaintiffs but which pertain to vehicles other than the subject vehicles, engines other than the engines used in the subject

vehicles, issues other than the alleged defect, or copies of Ford's responses (including drafts thereof) to the agency's prior inquiries concerning this subject matter. Of course, if these documents that we believe are non-relevant are of interest to the agency, we will provide copies or make them available for review upon request.

Request No. 15

Furnish Ford's policy on handling remedy failure and reports of remedy failures for safety recall 93V-125.

Answer

Ford's policy on handling owner remedy repair failures for this recall and other recalls is provided in Attachment VIII. The recall parts/workmanship warranty policy is the same as our standard parts/workmanship warranty policy, which is explained below:

1. The remedy replacement parts are supplied with a 12 Month/12,000 mile standard warranty, whichever occurs first. The warranty begins at the time/odometer reading of the recall service repair.

2. If there is a workmanship issue with the quality of the recall service performed (i.e., "properly installed part") by the independently owned and operated Ford dealer, the customer is advised to discuss the issue with the dealer's service manager or Ford's field representative in order to obtain a satisfactory resolution of the issue. If the customer is not satisfied with the service manager's decision he has the option to call, write or e-mail Ford's Customer Assistance Center. Ford's CAC will work as a mediator between the dealer and the owner in order to help resolve customer satisfaction and workmanship issues.

ATTACHMENT

AVAILABLE UPON REQUEST

L. W. Camp
Director
Automotive Safety Office
Environmental And Safety Engineering

Ford Motor Company
330 Town Center Drive
Dearborn, Michigan 48126 USA

December 15, 1998

Mr. Jonathan D. White, Chief
Recall Analysis Division,
Office of Defects Investigation, Safety Assurance
National Highway Traffic Safety Administration
400 Seventh Street, S.W.
Washington, D.C. 20590

Dear Mr. White:

Subject: Recall 93V-125 (93S68); RQ98-008; NSA-11jer

Enclosed is our final response to the agency's letter dated June 29, 1998, requesting information to examine the adequacy of the subject recall and whether other vehicles need to be included in the recall campaign. We have completed our analysis and are providing a complete answer to the remaining three of the fifteen requests with this response. The other twelve requests were responded to on August 11, and September 30, 1998.

We regret that the final response has taken almost six months to complete, and we do appreciate the agency's favorable consideration of our requests for extension. The extensions were necessary to both gather the significant volume of information which has been previously submitted to you in raw and summary form, and to conduct the thorough analysis of that information which is provided in this final response.

Ford believes that this analysis shows that the recall remedy was effective, that over 99.6% of the vehicles were successfully repaired on the first attempt, and that the vast majority of the 2,206 vehicles requiring a second repair were successfully repaired on the second visit. It also shows that most repeat visits occurred shortly after the initial recall repair indicating that there is no defect trend and, therefore, no unreasonable risk to motor vehicle safety.

Ford also believes that no extension of the recall is needed. Analysis of the post-recall 1993 population indicates a declining trend of reports and an extremely low fire rate, demonstrating no unreasonable risk to motor vehicle safety. Further, the reports indicate most dealerships were in a position to properly diagnose and repair such units.

If you have any questions concerning this response, please contact me at (313) 845-4320.

Very truly yours,

W J Baker for

L. W. Camp

Enclosure
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Ford Response to RQ98-008

The following is Ford Motor Company's final response to Request Numbers 8, 9, and 13 for the Agency's letter dated June 29, 1998. This inquiry involves the adequacy of recall repair for the campaign 93V-125 (Ford's 93368). The recall included 1990-1993 F-Series light trucks manufactured through December 17, 1992, with gasoline engines and dual fuel tanks. We have previously responded to your Request Numbers 1, 2, 4, 5, 6, 7, 10, 11, and 12 on August 17, 1998, and Request Numbers 3, 14 and 15 on September 30, 1998. Also, we have previously supplied the raw data in response to Request Numbers 8 and 9 in the August partial response and "work in process" summary tables in our September interim response.

Ford's response to this Recall Questionnaire was prepared pursuant to a diligent search for the information requested. We have made every effort to provide responsive documents and to supply thorough explanations intended to assist you in understanding the documents provided.

In overview, this final response completes Ford's analysis of the information submitted in August and September, provides Ford's assessment of the effectiveness of recall 93V-125, and our conclusions regarding potential extension of the recall to other Ford vehicles. We also provide an assessment of the possible causal factors for the alleged fuel leaks provided to us in the Agency's Lists A & B.

Answers to your specific requests are presented below and include documents and information in existence as of the date of the inquiry, June 29, 1998. As requested, after each numeric designation, we have set forth verbatim the request for information followed by our responses to it.

Request No. 8

> Furnish a summary table of all reports or incidents known to Ford in which fuel leakage or spillage occurred after they were initially repaired in recall campaign 93V 125. Identify by owner's name, model, model year, VIN, build date, date of incident, and type of incident. Furnish Ford's explanation of

these incidents including those List A with this letter. Include all reasons for the alleged inadequate remedy, including, but not limited to, vehicle design, manufacturing considerations, design of the remedy, and service problems.

Answer

The requested summary table is provided as Attachment I to this response. This table was developed using the following analysis:

From the previous submissions the information from the following Attachments were merged into this table:

August 11, 1998:

Attachment V, Lawsuits and Claims Investigations
Attachment VI, alleged fire reports from the Master Owner Relation System (MORS) file search

September 30, 1998:

Attachments II, III, IV and V, combined warranty, Common Quality Indicator System (CQIS) and MORS reports, for the 1990, '991, 1992 and 1993 MY respectively
Attachment VI (NHTSA combined A & B Lists)

The combined number of raw data reports from the above described merging of information from all sources was 2550 records. The summary table presented, however, has been refined from the raw data previously provided by the following analyses:

There were 75 reports where the incident date occurred prior to completion date of the recall remedy, or the recall remedy has not yet been installed. These reports were transferred to Attachment II. Where there is insufficient information to determine either the incident date or the recall completion date, or, if the comments indicate prior application of the recall remedy, the record has been maintained in the summary table.

There were 16 records involving 1993 Model Year (MY) vehicles that were built prior to the December 18, 1992 recall end date. These vehicles were built with the production remedy, a brass-backed one way poppett valve within the Fuel Delivery Module (FDM). The assembly plant phase-in of the revised design began on November 10, 1992, at Ontario Assembly Plant, and was completed across all four plants by December 17, 1992. Vehicles built with the revised design FDM during this phase in period, would not have been included in the recall notification process. Therefore, these records have been transferred to the summary table developed in response to Request No. 9 and are also provided separately in Attachment III.

There were 28 additional records involving 1993 MY vehicles built on or after December 18, 1992. These records were also transferred to the summary table developed in response to Request No. 9 and are also provided in Attachment III.

There were 33 reports which showed no evidence of cross-flow symptoms/conditions. These reports have been removed and are shown separately in Attachment IV.

There were 86 warranty claim reports that were incorrectly filed by dealers that reflect the completion of the original recall remedy. These reports were not a second recall repair attempt. These reports have been removed and are provided separately in Attachment V.

There were 2 records which included vehicles not equipped with dual fuel tanks. These reports have been removed and are provided separately in Attachment VI.

There were 14 records of warranty claims submitted by dealers to receive additional compensation for the removal and reinstallation of owner installed equipment, primarily trailer hitches. These hitches needed to be removed in order to facilitate completion of the recall remedy. These claim reports have been removed from the summary table and are provided separately in Attachment VII.

There were 11 reports from the Lawsuits and Claims Investigations, and 2 from the MOBS 11 alleged fire reports which upon further analysis do not represent cross-flow symptoms, e.g. under-hood fuel leaks/fire allegations. These reports have been

removed from the summary table and are provided separately in Attachment VIII.

There were 73 vehicles with multiple records, either the same incident reported through multiple sources, or subsequent repairs alleging fuel system issues. Each of these reports were assessed for duplicate incidents. There were 35 duplicative reports that had unrelated subsequent repairs. These duplicate reports were removed and are provided separately in Attachment IX.

Additional efforts were expended to complete VIN's, build dates and recall completion dates not included in the prior submissions, to the extent available from our records.

From the original 2550 reports previously provided, 344 reports were either transferred or removed from the summary table leaving 2206 records in the Attachment I summary table of vehicles that had the recall performed and subsequently required some additional remedy. Please note that a few of these reports do not specifically mention cross flow or fuel leakage.

As requested, we have reviewed each report in Attachment I and have provided Ford's assessment in the column labeled 'Assessment Code'. Code #1 includes recall remedy part quality issues which generally occurred soon after the recall remedy was first installed on the vehicle. There were 443 reports attributable to quality issues associated with the recall parts. Criteria used to make this assessment include: specific mention of service parts warranty in comments, or specific mention of replacement of recall related parts within 12 months or 12,000 miles from the recall completion (Ford's standard parts/workmanship policy for recall components).

While Ford exercised extreme diligence in the design, development and prove-out of the recall remedy, and the sourcing of components to qualified suppliers, it must be recognized that some "background level" of quality issue will typically be present for any high volume product. For the components involved in this recall remedy, the rate of issue attributable to service part quality was extremely low at 0.04%. The part quality issues were resolved early-on in the campaign, as the data demonstrates.

There were 82 reports that were assessed as Code level #2 which were attributable to dealer/technician workmanship issues. Our criteria used to make this judgment include: vehicle return for subsequent repair of cross flow symptoms within 10 days of recall completion date; owner observed cross flow shortly after the recall remedy was installed; evidence in comments regarding correction potentially related to the recall remedy , eg. electrical connections to fuel pumps, correction of kinked fuel lines, reconnection of fuel lines. As previously communicated to the Agency, the potential for kinking of the fuel lines during fuel tank lowering and reinstallation was known to Ford as a secondary causal factor for the cross flow condition. Cautions were prominently included in the recall instructions to dealerships, see our August 11, 1998 response Attachment IV, page 10 and, also, to the technicians by installation instructions within each recall remedy kit.

There were 1677 reports that were Coded #3 for alleged cross-flow issues, for reasons that are not evident from the specificity of available information.

Request No. 9

Furnish a summary table and copies of all reports known to Ford of incidents of the alleged defect occurring in the subject vehicles that were manufactured prior to July 22, 1989, or after December 17, 1992.

Answer

The requested summary table is provided as Attachment X. The development of this table started with the "work in progress" summary provided in the September 30, 1998, interim response, Attachment VII. It also includes the 84 transferred-in reports described in the response to Request Number 8. Also included are the appropriate vehicle reports from Lawsuits and Claims data and from the agency's Lists A and B. The table of "all reports known to Ford" includes 526 reports with multiple reports for some VIN's. There were four alleged fire reports, one report that was not related to cross-flow and two duplicate

reports. These reports were removed and are provided separately in Attachments XI, XII, and XIII, respectively.

Request No. 13

Furnish Ford's analysis, conclusions and opinions on (a) the effectiveness of recall 93V-125; (b) whether the recall should be extended to other Ford vehicles; and (c) the causes of the alleged fuel leaks described in the consumer reports provided with this letter.

Answer

(a) Effectiveness of recall 93V-125:

Ford believes that recall 93V-125 has been very effective in correcting the condition of fuel cross flow. Our conclusions are based on the following observations regarding the recall in its totality:

- 1.1 million vehicles have received the recall remedy. This represents a very high completion rate of 88.8% (up from 86.2% reported in our August response).

- Only 2206 vehicles of the 1.1 million vehicles have indicated a resumption or continuation of the issue, or about one-half vehicle per Ford dealership. This indicates a first time successful recall remedy repair rate of over 99.8%.

- The number of vehicles requiring multiple follow up repair attempts is extremely low. Only 73 of 2206 vehicles required more than one subsequent repair, or indicated continuance or resumption of the issue beyond the initial follow-up repair. This is out of 1.1 million completed vehicles.

- As evidence by Code #1 and #2 data in Attachment I, Ford experienced some minor parts quality and dealer workmanship issues during the launch and ongoing management of this very large and complex recall in order to remedy about 2.5 million

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fuel tanks in a timely basis. Ford endeavored to respond quickly to issues that arose in managing the overall process. An example is the diagnostic procedure provided to dealerships in early 1994, giving them an OASIS Message 3806/7 which provided additional procedures to follow, in case the recall remedy was not 100% effective due to other potential malfunctions of the fuel delivery system.

- The Attachment I summary table data shows a downward trend of reports from a peak which occurred during the height of the recall roll-out. Attachment XIV provides a chart of reports for both Model Year reports and totals versus calendar year. For 1998, the 50 total reports found from our exhaustive search of our databases represents a rate of only 0.4 per 10,000 vehicles. The second chart in Attachment XIV looks at the time between the recall remedy and the reports of follow on repair. Our conclusion from this chart is that most repeat visits occurred shortly after the initial recall repair, indicating that there is no defect trend, or unreasonable risk to safety in those vehicles.

- After more than five years in service, the number of fire allegations is only 0.158 per 10,000 vehicles, and there have been no allegations in the past 1.5 years. Also, fuel transfer only occurs when the fuel pumps are running, so the risks of fires in "garaged" vehicles is extremely low.

From these data and observations, Ford concludes the recall remedy properly corrected the fuel tank cross-flow concern. The charted data clearly shows a decreasing trend, and consequently, an extremely low and decreasing risk of fires. Ford believes this issue is behind us and there is no unreasonable risk to motor vehicle safety.

(b) Whether the recall should be extended to other Ford vehicles:

Ford does not believe that the recall should be extended to other vehicles (e.g. post recall 1998 vehicles) for the following reasons:

- There has been only one report alleging a fire in this population that was allegedly caused by cross-flow. There were no injuries attributed to it. This results in an alleged

fire rate of about 0.036 per 10,000 vehicles. This is an extremely low rate, demonstrating no risk to motor vehicle safety.

- Although there are 487 vehicle reporting fuel tank cross flow, the data also indicate that all but 25 owners were able to obtain a satisfactory repair with one visit to the dealership. The total number of dual fuel tank F-Series vehicles in this population is 274,352. Ford believes this indicates most dealerships were in a position to properly diagnose and repair such units.

- The number of cross-flow reports were grouped and charted by incident date versus calendar year. These data are provided in chart form in Attachment XV. The data is similar to the recall population chart shown in Attachment XIV which shows a peak around the recall campaign followed by a strong downward trend with increasing calendar years. This chart demonstrates no defect trend, and, therefore, no unreasonable risk to motor vehicle safety.

- Approximately two-thirds of the reports occurred before 36,000 miles, indicating that most owners were able to obtain a remedy under warranty.

Based on the above, there is no evidence of an unreasonable risk to motor vehicle safety. Ford believes that any issues associated with cross-flow on post-recall 1993 F-Series dual tank vehicles tended to occur early in the vehicles' service history, may have been related to the publicity surrounding the recall, and are now largely resolved in this population. The data does not demonstrate a defect trend.

(c) The causes of the alleged fuel leaks described in the consumer reports:

Each of the 121 VIN reports provided by the Agency's Lists A and B has been reviewed as to its content. To the extent additional records were available from Ford's September 30, 1998 response to RQ98-008 that corresponded to the List A and B VIN's, they were used to assist the analysis. Results of the analysis are shown in Attachment XVI.

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In brief, they show that where an assessment is possible from the information available, a number of units may have required one or both fuel pumps to be replaced. Dealership workmanship was another potential contributor identified in the analysis.

U.S. Department of Transportation
National Highway Traffic Safety Administration

ODI RESUME

INVESTIGATION: RQ98-008
SUBJECT: Ford F-Series Dual Fuel Tank Leakage
PROMPTED BY: 93V-125, EA93-001, RQ98-008
PRINCIPAL ENGINEER: John Ridgley

DATE OPENED: 5/29/98
DATE CLOSED: 11/4/99

MANUFACTURER: Ford Motor Company
MODEL(S): F-Series Light Trucks and Cab Chassis with gasoline engines and dual fuel tanks
MODEL YEAR(S): 1990-1993
VEHICLE POPULATION: 1,370,300

PROBLEM DESCRIPTION: The subject vehicles can experience fuel transfer from one tank to the other due to malfunctions in the fuel system. When fuel is pumped or returned to the non-operating tank (cross flow), the capacity of the non-operating tank can be exceeded, causing fuel to overflow past the filler cap, creating a fire potential.

FAILURE REPORT SUMMARY

	ODI	MANUFACTURER	TOTAL
COMPLAINTS:	251	2,994*	3,245
CRASHES:	0	0	0
INJ CRASHES:	0	0	0
# INJURIES:	0	3	3
FAT CRASHES:	0	0	0
# FATALS:	0	1	1
FIRES:	2	17	19

* 260 of these reports are contested by Ford and current through June 29, 1998

ACTION: Close RQ98-008 and upgrade to an EA.

ENGINEER: [signature] 11/4/99 DATE
DIV CHF: [signature] 11/4/99 DATE
OFC DIR: [signature] 11/4/99 DATE

SUMMARY: On July 14, 1993, Ford Motor Company filed a Defect Information Report concerning fuel tank cross flow leakage on certain F-Series light trucks and cab chassis built from July 22, 1989 through December 17, 1992. The remedy was to replace the fuel pressure regulator and install check valves between each fuel supply line and fuel tank, to repair the supply side fuel cross flow problem. (Recall 93V-125).

ODI opened RQ98-008 on May 29, 1998 because of the large number of alleged remedy failures and reports of fuel cross flow on vehicles outside of the recall population. Fifty three percent of the total number of ODI's reports occurred during 1998-1999 and reveal an increasing trend for the past four years. Since January 1995 ODI has received 179 reports of remedy failure, 62 reports of out of scope vehicles, and 10 unknown cross flow reports. Ford has provided responses on August 11, September 30, and December 15, 1998 to ODI's information request of June 29, 1998. In Ford's December 15th submission,

Ford requested that 344 remedy failure reports be removed from its previous submitted reports because they were either duplicates or should be placed in other categories. This deletion is reflected in the summary table on page one of this resume. The number of remedy failures and out of scope reports in this summary table was determined by counting the data submitted by Ford. Part of this investigation will be to determine the correct number of remedy failures and fires in safety recall 93V-125.

Background:

Ford became aware of fuel cross flow in the subject vehicles through field reports in early 1991. Ford's initial analysis of this problem attributed the cause to be improper assembly or service of vehicles resulting in kinked fuel lines or plugged fuel filters that resulted in high fuel system pressures. Subsequent investigation determined that the principal cause of fuel transfer is damage to the check valve associated with high fuel system pressures that can develop after engine shutdown during hot-soak conditions if there is also a malfunction of the fuel pressure regulator.

During hot-soaking conditions, fuel system pressure may exceed 200 psi, and may cause the fuel delivery module (FDM) check valve to extrude through the small opening it is intending to seal, allowing fuel to be pumped from one tank to the non-operating tank. Kinked fuel return lines was a secondary causal factor and, Ford says, most prevalent for the 1990-1991 Model Years. The FDM also contains a shuttle valve which has two functions: 1) to direct the return fuel to the operating tank and 2) to allow fuel to return to the tank when the return fuel pressure exceeds 20 psi during high ambient soaking conditions after hot engine shutdown. This function safeguards the engine from having excess fuel pressure at the fuel rail assembly during a key-off condition. If the fuel return line to the operating tank is kinked or the shuttle valve in the operating FDM is malfunctioning, the return line pressure in an engine running condition can exceed 20 psi and open the non-operating FDM shuttle valve, allowing fuel to return to the non-operating tank.

In December 1990 Ford made a production change to prevent fuel line kinks during assembly by securing the aft-axle fuel return line to the fuel tank strap and to provide 100% inspection of fuel lines.

In August 1991, Ford introduced into production a fuel line change to eliminate fuel line kinking. A Teflon material with braided stainless steel covering and Ethevan outer skin replaced the nylon tubing. Development tests on 1992 rear fuel lines verified that the aft-axle fuel return line would not kink when the aft-axle tank is serviced. However, even with these measures, occurrences of cross flow continued to be reported.

On December 17, 1992, a revised FDM, with an improved fuel supply check valve, was incorporated in production that was resistant to damage from higher fuel system pressures regardless of the cause. There are two FDM's required per vehicle, one for each fuel tank.

A stainless steel fuel pressure regulator was incorporated into production in July 1993 for Job #1, 1994 Model Year. This upgraded pressure regulator is also part of the safety recall campaign, but it was not installed on the 1993 model year vehicles built after December 17, 1992.

Recall Remedy Failures:

Ford reported in its response of December 15, 1998 that 2,206 vehicles had remedy failures; a failure rate of 201/100K, with 73 vehicles having the recall repair performed two or more times. ODI counted 2,810 remedy failures less the 344 reports Ford either transferred or removed from its previous submission, leaving a total of 2,466 remedy failures. In response to ODI's request for analysis of why remedy failures were occurring, Ford stated: (a) poor maintenance, improper service or normal wear out, (b) the remedy parts were defective, and (c) the fuel return lines were kinked during the recall remedy work.

Fuel cross flow can occur from malfunctions on the supply (pressure) side of the fuel system or the return side. In its messages to dealers, Ford stated that recall 93V-125 addressed only the supply side problem. In another message, dated October 20, 1993, Ford instructed its dealers to replace the fuel tank pump (FDM) if the check valves cannot be installed, due to frame cross member interference. Ford has issued at least nine service messages to dealers relating to safety recall 93V-125, in addition to the recall notification. One of these messages, dated May 6, 1994, was a detailed procedure on how to diagnose fuel cross flow conditions if the recall remedy was not effective. A June 1994 message told dealers that fuel transfer may continue after the recall remedy because of a failure of the shuttle valve, on the return side. In this case, the fuel pumps, which were not part of the recall remedy, needed replacement [Note: fuel pump replacement really means fuel delivery module replacement because they are an integral unit]. Most often fuel pump replacements were covered under Ford's 12 month/12,000 mile warranty.

In its response of August 11, 1998, Ford stated that remedy failures and fuel cross flow caused by other than part failures or kinked fuel return lines, are most likely due to dirt or foreign particles getting into the fuel system, bad gasoline or certain fuel additives being put into the fuel tanks, or poor vehicle maintenance, which can clog or damage the FDM components. Ford did not explain why the venturi filter screen, fuel pump filter screen and fuel filter are inadequate, and why cross flow incidents are at a very low rate on 1994 and later models.

Scope:

The second area of concern is the scope of recall 93V-125. Ford submitted 528 reports of 1993 F-Series vehicles having cross flow problems, which were manufactured after December 17, 1992, the cutoff date of the recall; a failure rate of 194/100K. This compares with a failure rate of 62/100K, based on the 700 reports submitted in Ford's 573 notification, which initiated recall 93V-125. It should also be noted that as of May 1993, Ford had 1,877 warranty reports for this problem on the vehicles within the recall population. The 1993 F-Series built after December 17, 1992, first experienced fuel cross flow at an average of 22,400 miles. The 1990-1992 vehicles initially experienced fuel cross flow at an average of 30,100 miles and 26,300 miles for the cross flow incident to first occur on the recalled 1993 F-Series.

Ford stated in its response to RQ98-008, dated August 11, 1998: "At the time of the safety recall, field analyses returned parts showed the significant root cause was due to such failures of the supply side poppet valve located within the FDM." Since the failure rate of the post-recall 1993 vehicles is greater than the initial failure

rate, it is unlikely that this was the root cause. The large number of out of scope vehicles, late model year 1993 F-Series, with fuel cross flow problems is a strong indication that the 1993 design FDM, introduced into production in December 1992, does not adequately address the fuel cross flow and overflow problem.

Ford also investigated fuel cross flow on 1993 and 1994 F-Series vehicles, built after January 1, 1993. Ford indicated that these reports of fuel cross flow may be caused by cold ambient temperatures. In a data table dated November 2, 1994, only 35% of the cross flow incidents occurred in cold ambient conditions. In September 1994, Ford introduced into production a fuel line with an external one way check valve for all F-Series with dual fuel tanks. This valve was to help prevent fuel cross flow. In January 1995, Ford made another change by deleting this external check valve/line and incorporating another improved check valve inside the FDM. This check valve incorporated a guiding feature, improved valve/seat geometry and improved low temperature seating material. ODI has only six fuel cross flow reports on the 1994 F-Series and two reports on the 1995 F-Series. This is 3% of the ODI failure rate of the 1990-1993 F-Series vehicles. While Ford was not requested to provide information about cross flow in 1994-1995 F-Series in this RQ, it appears that the solution to fuel cross flow may be revealed in the design of those vehicles.

Summary:

From the information gathered to date, it appears that there can be multiple causes and/or a combination of causes for fuel cross flow and that the recall remedy may be inadequate.

In a letter to NHTSA in December 1992 (EA93-001), Ford stated that clogged fuel filters, malfunctioning fuel pressure regulators, or kinked fuel return lines can cause fuel cross flow. In their service bulletin, dated March 1993, Ford told their dealers that fuel cross flow is almost always caused by a pinched/restricted fuel line, although other causes are possible. In April 1993, Ford told NHTSA that fuel overflow cannot be attributed to a single, systematic root cause. In Ford's Part 573 notification, July 14, 1993, Ford stated that the cross flow can occur through a malfunctioning check valve within the fuel pump assembly. More recently Ford states that improper fuel tank servicing, dirt and foreign particles, bad gasoline and additives may also cause fuel cross flow.

Ford has not yet provided information to adequately explain the large number of remedy failures, the greater failure rate of the post recall 1993 F-Series than the initial recall population, why the return side of the fuel system was not addressed as part of recall 93V-125, and the scope of Ford's investigation of fuel cross flow on late 1993 F-Series vehicles. Ford's data shows that Ford is experiencing a declining trend of fuel cross flow reports. The increasing ODI report trend shows that fuel cross flow is continuing at some unknown level and that owners may not be going back to Ford dealers because they are beyond Ford's 12 month/12,000 mile warranty. From ODI's limited survey of 24 complainants, indications are that many of owners are repairing their vehicles at independent repair shops, especially if one or both FDM's need replacement. Also in that survey, more than half of the owners stated they did not fill both fuel tanks to avoid the cross flow problem. Further investigation is needed to confirm these preliminary conclusions and to determine the true extent of the fuel cross flow problem.